

MONARTHROPALPUS BUXI LAB. IN NEW JERSEY
(DIP.).

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This insect, commonly known as the European boxwood leaf miner, has already been recorded by me as occurring in New Jersey (*PSYCHE*, June, 1915), (*Ent. News*, vol. 27, p. 13). Its distribution was at first thought to be rather limited, but it is now known to occur in widely separated parts of the state, namely, Rutherford, Far Hills, Gladstone, Peapack, South Orange and Eatontown and will undoubtedly be found in other places in the future. It was evidently introduced from France or Holland, within the past five years, especially the latter as thousands of boxwood plants are annually imported into New Jersey from that country while, comparatively, only a few come from France. It has also been taken at various times by inspectors examining boxwoods from these countries.

At present, its injuries in New Jersey are confined principally to all varieties of boxwoods growing in nurseries and on private estates. The first sign of injury likely to be noticed by most persons is a small yellowish or light green spot on the upper surface of the leaf. Directly under this on the lower surface is quite a pronounced, irregular, oval blister due to the young maggot enlarging its mine. Later in the season the injury is more apparent and there will be a slight elevation on the upper surface with a yellowish or brownish discoloration. In severe infestations, the entire leaf is taken up by irregular oval swellings which are largest on the under surface. Badly infested plants present during the spring, the superficial appearance of having been winter killed. The leaves are discolored, somewhat brownish and finally drop off. Closer examination however will reveal the larvæ or pupæ within their galls. Inasmuch as boxwood plants have strictly an ornamental value, a plant having unsightly bare branches with new leaves developing at the tips is far from beautiful. Specimen plants which have been trimmed for years in some particular shape are sometimes ruined by the insects infesting an entire side or top.

Infested plants obtained during the middle of April and kept in the laboratory were examined daily and the pupal stage found to last from fourteen to eighteen days. As it was several degrees warmer there than in the open, growth was undoubtedly accelerated. In the open this stage lasted an average of three weeks. In the laboratory, the first adults emerged April 30 and every day following for two weeks, while in the open, the first emergence was on May 20. Inasmuch as the weather varies in different years, it can be safely said that, in New Jersey, the adults appear as a rule during the latter part of May.

According to Professor Chaine who studied the insects at Bordeaux, France, oviposition lasts from two to three weeks, the female depositing the eggs singly in a slit cut by the ovipositor. Young leaves are selected and the eggs deposited at a distance from each other. In the laboratory, oviposition started a couple of days after emergence, the adult females selecting the under surfaces of tender green leaves. Each female would insert the tip of her abdomen in the tissue and sway the body from side to side during the act. The eggs are tiny, oval and translucent, wide at the middle and tapering uniformly toward each rounded end, being about one one-hundred and twentieth of an inch long and twice as long as broad. To the naked eye, they are visible only as white specks. They appear to be laid on their sides in the tissue and the only outward indication of their presence is a slight elevation of the tissue immediately over them, these swellings sometimes being a darker green than the remainder of the leaf. The exact location of each egg can easily be seen by holding the leaf up to the light and examining it with a hand lens. Each light oval spot surrounded by a dark ring means an egg. Several leaves examined in this way were found to contain as many as thirty-three and thirty-five eggs, which were later dissected out. This condition however would prevail only in a cage where many females were forced to oviposit in a few leaves as it was under such conditions that the above numbers were found.

After hatching, which required from two to three weeks in the laboratory, the yellowish white maggots mine the leaves all summer, making small oval pockets which sometimes run together on one side of a midrib if many larvæ are present. The winter is passed in these pockets, the larvæ transforming to pupæ in the

spring. So as to facilitate the emergence of the adult, the pupa issues partly through the thin lower surface of the leaf. An infested leaf may contain from one to twelve and possibly a few more larvæ, although twelve was the largest number taken from a single leaf. The young larvæ are yellowish-white, later becoming yellowish-green when full grown at which time they are about one-eighth of an inch in length. The pupæ also are about one-eighth of an inch long, light orange colored and quite active, while the adults are slender midges with hyaline wings, orange colored bodies and remarkably long legs and antennæ and appear to be fairly strong fliers considering their small size.

Technical descriptions of both sexes and the larva together with suggestions for control can be found in the Thirtieth Report of the State Entomologist of New York by E. P. Felt and need not be gone into here. Considering the damage which this midge is capable of doing and the lack of really efficient remedies together with the fact that even partly injured boxwoods are no longer ornamental, it would appear that the prompt destruction of infested plants before the adults emerge in the spring would be the best plan to pursue.

EXPLANATION OF PLATE XIII.

Fig. 1. Boxwood leaf with lower surface removed to show larval mines.

Fig. 2. Leaves showing galls and empty pupal cases of the midges.

Fig. 3. Leaf showing distribution of the eggs in the tissue, when many females are forced to oviposit in a few leaves.

Fig. 4. Egg.

Fig. 5. Larva.

Fig. 6. Pupa.

Fig. 7. Female midge.

Fig. 8. Male midge.